

REMARKS

Claims 9-21 currently appear in this application. The Office Action of October 2, 2002, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicants respectfully request favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Claim Objections

Claims 5-8 are objected to under 37 CFR 1.75(c) as being in improper form.

Claims 5-8 have been cancelled by the present amendment in favor of new claims 17-21. There are no multiple dependencies in these claims.

Art Rejections

Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Nomura et al.

This rejection is respectfully traversed. Claims 1-8 have been replaced by new claims 9-21. Claim 9, which replaces claim 1, requires that the steel sheet is blackened to have an L-value equal to or less than 30. There is nothing in Nomura et al. about blackening the steel sheet.

Moreover, the surface of the galvanized alloy steel plate in the present invention is colored by an anodic/cathodic treatment in acid solution devoid of Cr ion, and the steel sheet is not immersed in an acid solution in order to remove the film layer on the surface of the galvanized alloy steel plate.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Sujita et al.

This rejection is respectfully traversed. Sujita et al. disclose an organic composite coated steel sheet wherein the steel sheet is coated with a zinc or zinc alloy coating sheet, chromate film is applied to the zinc coating, and a resin coating film is formed on the chromate film.

In contrast thereto, the surface of the galvanized alloy steel plate in the present invention is colored by an anodic/cathodic treatment in acid solution containing no Cr ion. The dark colors are permitted for a colored layer, although dark blue-black and black are preferred. Sujita et al. are silent with respect to black coloring.

Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagai et al.

This rejection is respectfully traversed. Nagai et al. disclose a steel sheet coated with a zinc

plating layer, a chromate treatment on the plating layer, and a layer of paint. Silica is added to the chromate film in order to further strengthen the corrosion resistance of the chromate film.

In contrast thereto, the surface of the galvanized alloy steel plate in the present invention is colored by an anodic/cathodic treatment in acid solution containing no Cr ion. The organic resin coating is applied to the blackened surface of the galvanized alloy steel plate after the anodic/cathodic treatment, and this composite is made into a patrone cap.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura et al. in view of Smith et al. The Examiner concedes that Nomura et al. do not specifically disclose that their urethane resin has the claimed pencil hardness, tensile strength, or extension ratio. The Examiner notes that Smith et al. disclose an aqueous polyurethane dispersion having a higher modulus and that may be used to coat cold rolled steel plates and having an elongation of 290%, a tensile strength of 5800 psi, and a pencil hardness of 1H.

This rejection is respectfully traversed. As discussed *supra*, the coated steel sheet of the present invention is quite different from that of Nomura et al. because of the anodic/cathodic treatment and lack of

chromium ion in the treatment bath. Smith adds nothing to the Nomura et al. disclosure, because Smith et al. merely note that the polyurethane composition can be applied to any type of substrate. There is nothing in Smith et al. that would lead one skilled in the art to coat the steel sheet of the present invention with such a polyurethane coating.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sujita et al. in view of Smith et al.

This rejection is respectfully traversed. As discussed above, there is nothing in Sujita et al. that would lead one skilled in the art to produce the steel sheet according to the present invention. As Smith et al. merely disclose that the polyurethane coating disclosed therein may be applied to any type of surface, Smith et al. add nothing to Sujita et al. that would lead one skilled in the art to the steel sheet as claimed herein.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai et al. in view of Smith et al.

This rejection is respectfully traversed. Nagai et al. disclose a steel sheet coated with a zinc plating layer, a chromate treatment on the plating layer,

and a layer of paint. Silica is added to the chromate film in order to further strengthen the corrosion resistance of the chromate film.

In contrast thereto, the surface of the galvanized alloy steel plate in the present invention is colored by an anodic/cathodic treatment in acid solution containing no Cr ion. The organic resin coating is applied to the blackened surface of the galvanized alloy steel plate after the anodic/cathodic treatment, and this composite is made into a patrone cap.

Smith et al. add nothing to Nagai et al., because Smith et al. are completely silent as to the steel sheet or other substrate onto which the disclosed polyurethane composition can be coated.

The following cross sections of the present invention and or Nomura et al. and Sujita et al. illustrate the differences between the present invention and the sheets of the cited references.

1) Cross section of the present invention

Organic resin layer (containing colloidal silica and/or agent for providing lubricant function)
Blackened layer applied by an anodic/cathodic treatment (Treatment solution is acid and do not contain Cr ion)
Galvanized alloy layer
Steel sheet

2) Cross section of Nomura et al.

Resin coating
Chromate treatment
Immersing in acid bath and grinding
Zinc- or zinc alloy-electroplating layer
Steel sheet

3) Cross section of Sujita et al.

Resin coating
Chromate-silica film layer
Zinc or zinc-based alloy plating layer
Steel sheet

4) Cross section of Nagai et al.

Resin coating
Chromate film layer
Zn plating layer
Zn-X alloy electroplated layer with cracks
Steel sheet

In re Appl. No. 9/743,849
Confirmation No. 8746

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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IN THE SPECIFICATION

Page 1, please amend the second paragraph beginning on line 10 as follows:

Recently, in a field of office tools, optical devices, electric products and parts of a vehicle, a demand ~~offor~~ a black colored steel sheet is increasing in view of an ornamental effect, an improvement of absorption with respect to reflective energy and thermal absorption and a function of preventing light from reflecting. ~~It has been developed aA~~ steel sheet ~~ofhas~~ been developed which has a surface ~~is~~ colored with black steel sheet looks like a high-grade article even in the steel is naked.

Page 1, please amend the last paragraph beginning on line 28 as follows:

However, regarding the steel sheet treated by a black color treatment as described in the item (1), an adhesive characteristic between a black resin coating layer and a surface of the steel sheet is weak. When the surface of the steel sheet is damaged by press processing, ~~a groundwork metal of~~ the steel sheet would be exposed. Therefore, the resin coating layer ~~is~~ necessary to be thickenshould be thicker. It would be

demerit in view of a production ~~cost~~costs. Regarding the steel sheet as described in the item (2), in order to reinforce ~~an~~ corrosion resistance, there is a black colored steel sheet with a surface treatment (Japanese Patent Laid-Open Publication No. 63-60886) wherein a chromate layer and a transparent/translucent organic resin layer is provided on a black colored galvanized steel plate. However, depending aon the treatment condition of the chromate layer, ~~it would be afraid there~~ is a danger of deteriorating a black ~~ornament~~ornamental effect. Further, there is no actual suggestion about the composition of such a resin layer in view of improving an adhesive characteristic of the resin layer with respect to a galvanized layer.

Page 2, please amend the second paragraph beginning on line 24 as follows:

However, a black ornament effect is damaged by flaws on ~~a~~the surface of a steel sheet caused by ~~luck~~lack of smoothing of the steel sheet when the patrone cap and so on made of the steel sheet is caulked. It would become ~~a problem of reducing~~difficult to reduce the corrosion resistance by exposing the groundwork of the steel plate.

Page 3, please amend the first paragraph as follows:

A feature of a resin coated steel sheet according to the present invention ~~as claimed in claim 1~~ is ~~comprising~~the combination of a galvanized alloy steel sheet and an organic resin layer formed on a surface of the galvanized alloy steel plate, wherein the galvanized alloy plating is formed on at least one surface of a steel sheet and treated by an anodic/cathodic treatment in acid solution or an immersion treatment in solution including nitride ion, so that a surface of a galvanized alloy steel sheet is colored.

Page 3, please amend the second paragraph beginning on line 9 as follows:

A feature of a resin coated steel sheet according to the present invention ~~as claimed in claim 2~~ is ~~comprising~~the combination of a galvanized alloy sheet and an organic resin layer formed on a surface of the galvanized alloy steel plate, wherein galvanized alloy plating is formed on at least one surface of a steel sheet and treated by an anodic/cathodic treatment in acid solution or an immersion treatment in solution including nitride ion. By this process, a surface of a galvanized alloy steel sheet is colored and the organic resin layer

includes colloidal silica and/or an agent for providing a lubricant function at a surface of the organic resin layer.

Page 3, please amend the third paragraph beginning on line 20 as follows:

In a resin coated steel sheet described above, it is preferable that resin formed as the organic resin layer is a resin at least selected from athe group of urethane system resinresins, polyester system resinresins, acrylic system resinresins and olefin system resinresins.

Page 4, please amend the seventh paragraph beginning on line 26 as follows:

In a resin coated steel sheet according to the present invention as shown in Fig. 1, a galvanized alloy layer is treated by an electrolytic treatment selected from ~~a group of~~ an electrolytic treatment such as an anodic treatment and a cathodic treatment in an acid solution or an immersion treatment in a solution including nitric ion so as to form a colored layer 2 on at least one surface of the steel sheet 1. An organic resin layer 3 is formed on a surface of the colored layer 2.

Page 5, please amend the last paragraph
beginning on line 32 as follows:

In general, a normal cold rolled steel sheet is used as a substrate. A cold rolled steel sheet of which a base is extreme medium/low carbon aluminum ~~killed~~ steel molding is used. Further, extreme low carbon steel with carbon of equal or less than 0.003 wt% and a cold rolled steel sheet made of non-aging steel into which niobium, titanium and others are added are used. Chromium steel including chromium of 3 to 18 wt% or a stainless steel (nickel of 1 to 10 wt% may be included) is preferably used.

Page 6, please amend the third paragraph
beginning on line 22 as follows:

If the steel sheet 1 is ~~electric~~electrolytically plated in a plating bath mainly including zinc in which water-soluble salts of cobalt, nickel and/or molybdenum are also ~~comprised~~included, ~~it one~~ can ~~be obtained~~obtain a galvanized alloy plating layer 10 in which cobalt, nickel and/or molybdenum is co-deposited or dispersed.

Page 7, please amend the first paragraph
beginning on line 16 as follows:

In order to improve ~~anthe~~ corrosion resistance
and ~~anthe~~ adhesive characteristic with respect to the
organic resin layer 3, although a chromate treatment for
forming a chromic hydrate oxide coating layer (including
an electrolytic chromate treatment) as an upper layer may
be ~~treatedused~~, the colored layer is apt to be solved
~~inby~~ a chromate treatment solution such as chromic
solution and sodium bichromate and ~~it would be~~
~~afraidthere is a danger~~ of deteriorating ~~an ornamentthe~~
~~ornamental~~ effect.

Page 8, please amend the second paragraph beginning on line 5 as follows:

In the case of utilizing the material for a patrone cap, it is preferable to use a urethane system resin with an individual pencil hardness of H to 6H, tensile strength of 300 to 500 kg/cm² and extension ratio of 250 to 450%. In such a case, athe thickness of the resin can be equal to or less than 2µm.

Page 8, please amend the third paragraph beginning on line 10 as follows:

In the case of urethane resin having the above described characteristics, the processing characteristic of the resin coated layer according to the present invention would be improved so that an ornament effect of a patrone cap after processing can be improved. If a pencil-hardness is F or HB softer than H, anthe abrasion and wear resistance become weaker in the case of utilizing the material for a patrone cap. If the pencil-hardness is 7H to 9H harder than 6H, the processing characteristic becomes weaker. If the tensile strength of the resin is less than 300 kg/cm² and anthe extension ratio of the resin is less than 250%, the processing characteristic would become weak. If the tensile strength of the resin is more than 500 kg/cm² and anthe

extension ratio of the resin is more than 450%, its effect is saturated and it is not economic in the view of athe production cost.

Page 8, please amend the last paragraph beginning on line 36 as follows:

However, in the case of utilizing these kinds of resin as a patrone cap, the characteristics thereof apt to become inferior to those of urethane system resin and flaws and unevenness of black color of the patrone cap are not noticeable. In order to have the processing characteristic as similar as that of urethane system resin, athe thickness of the resin-coated layer should be thickenedincreased. It is ~~demerit in view of an economic~~ reasoneconomically not desirable.

Page 10, pleas amend the second paragraph beginning on line 12 as follows:

In order to improve ~~a color ornamentthe~~ ornamental color, that is, to a clear black color, it is preferable to add black pigment ~~intoto~~ the organic resin layer 3. In such a case, the pigment ~~of which the~~ content ismay be added in an amount equal to or more than 0.1 wt% ~~may be added~~. The process characteristic is reduced in the case that the additive amount is too much

and flaws and unevenness of black color are observed. Therefore, the content ratio of the black pigment is preferably equal to or less than 30 wt%. Regarding the black pigment, ~~it~~ one may ~~be used~~ use carbon black of which a grain diameter is 50 to 200 μm .

Page 11, please amend the first paragraph beginning on line 5 as follows:

Although Fig. 1 shows one embodiment of a resin coated steel sheet according to the present invention, wherein ~~the~~ both surfaces of the steel sheet ~~is~~ are coated with a resin layer 3, respectively. A colored layer 2 and the resin layer 3 may be formed on only one surface of a resin coated steel sheet according to the present invention. In such a case, a galvanized alloy layer is provided at a respective surface of a steel sheet as shown in Fig. 3. The colored layer 2 and the resin-coated layer 3 are formed on ~~the~~ one surface of ~~the~~ both surfaces.